

**AMENDMENTS TO THE SPECIFICATION:**

**Please replace the paragraph on page 2, lines 3-18, with the following amended paragraph:**

At present, an Li-Co composite oxide having a layer structure belonging to the space group R3-m (hereinafter referred to also as  $\text{LiCoO}_2$ ) is mainly used as a positive active material in lithium secondary batteries for small public-use applications. The reasons for this are that the  $\text{LiCoO}_2$  shows a flat ~~discharge potential~~ discharge potential profile at around 3.9 V (vs.  $\text{Li/Li}^+$ ) and that since the delay grade of lithium ion diffusion in the solid  $\text{LiCoO}_2$  phase even in the final stage of discharge is small, the discharge polarization accompanying on the delay can be diminished and high energy can be taken out over a prolonged time period. In addition, even when lithium ions are extracted to about 4.3 V (vs.  $\text{Li/Li}^+$ ) in the charge direction, the crystal structure retains a rhombohedral crystal and, hence, the composite oxide is excellent also in charge/discharge cycle performance. As described above, the  $\text{LiCoO}_2$  is a positive active material which has a high energy density and satisfactory charge/discharge cycle performance.

**Please replace the paragraph on page 3, lines 8-18, with the following amended paragraph:**

Lithium manganate ( $\text{LiMn}_2\text{O}_4$ ) also can be made to have an operating potential around 4 V and to show a flat ~~discharge potential~~ discharge potential profile by partly displacing the manganese sites by lithium. However, there has been a problem that this active material has a

low theoretical discharge capacity and a problem that a manganese species dissolves away from the active material in a high-temperature environment and this causes a decrease in battery performance. It is explained that the problem of this manganese species dissolution is attributable to the Jahn-Teller strain of trivalent manganese.

**Please replace the paragraph on page 10, line 7-20, with the following amended paragraph:**

(4) A non-aqueous electrolyte battery having a positive electrode, a negative electrode, and a non-aqueous electrolyte, characterized in that the positive electrode contains a lithium-manganese oxide (A) having a spinel structure and represented by the general formula  $\text{LiMn}_2\text{O}_4$  and a lithium-nickel-manganese-cobalt composite oxide (B) having an  $\text{Li}_a\text{Ni}_b\text{Mn}_c\text{Co}_d\text{O}_e$  type layer structure and represented by the general formula  $\text{Li}_a\text{Mn}_b\text{Ni}_c\text{Co}_d\text{O}_e$ ,

wherein

$$0 < a \leq 1.3$$

$$|b-c| < 0.05$$

$$|b-c| \leq 0.05$$

$$0.6 \leq d < 1$$

$$1.7 \leq e \leq 2.3$$

$$b+c+d=1.$$

**Please replace the paragraph on page 16, lines 14-21, with the following amended paragraph:**

It is therefore necessary to satisfy  $b+c+d=1$  and  $0.6 \leq d < 1$  for attaining high high-rate discharge performance and inhibiting a high-temperature charge capacity from increasing. The lower limit of the value of  $d$  is preferably 0.8 ~~or larger~~, more preferably 0.83 ~~or larger~~, most preferably 0.90 ~~or larger~~. The upper limit of the value of  $d$  is more preferably 0.99 ~~or smaller~~, most preferably 0.95 ~~or smaller~~.

**Please replace the paragraph on page 18, line 6, through page 19, line 16, with the following amended paragraph:**

The Mn-Ni-Co mixture precursor to be produced preferably is a compound in which the manganese, nickel, and cobalt have been evenly mixed together. Any production process satisfying this requirement may be used without particular limitations. However, since the crystal structure is required to be highly stable to lithium extraction/insertion in the element constitution ranges according to the invention, use may be made of "a coprecipitation process in which an acidic aqueous solution of manganese, nickel, and cobalt is precipitated with an aqueous alkali solution, e.g., an aqueous sodium hydroxide solution". By this method, a positive active material showing especially high battery performances can be produced. In this method, it is preferred to generate crystal growth nuclei under such conditions that the amount of ammonium ions in the reaction system is in excess of the amount of ions of these metals, i.e., manganese, nickel, and cobalt, because precursor particles which are exceedingly homogeneous and highly bulky can be produced. The absence of ammonium ions is undesirable because ions of those metals rapidly precipitate through acid-base reactions and this results in random crystal orientation to form a precipitate having a low bulk density. When ammonium ions are present,

the rate of the precipitation reactions is reduced because precipitation occurs via metal-ammine complex formation reactions and, hence, a highly bulky precipitate of primary-particle crystals having satisfactory crystal orientation can be produced. The presence of ammonium ions is therefore preferred. It is also possible to regulate properties of the coprecipitation compound, such as particle shape, bulk density, and surface area, by selecting apparatus factors such as reactor shape and the kind of stirring blades and various factors including the period of precipitate residence in a reaction vessel, reaction vessel temperature, total ion amount, liquid pH, ~~ammonia ion~~ ammonium ion concentration, and concentration of an oxidation number regulator.

**Please replace the paragraph on page 27, line 23, through page 28, line 20 , with the following amended paragraph:**

Incidentally, either of the above-described composite oxides according to the invention may be used in combination with any one of lithium-containing phosphoric acid salts, lithium-containing sulfuric acid salts, and the like or with a mixture of two or more of these. Examples of lithium-containing transition metal oxides include ones represented by the chemical composition formula  $\text{Li}_x\text{MX}_2$  or  $\text{Li}_x\text{MN}_y\text{X}_2$  (wherein M and N represent a metal in Groups I to VIII, and X represents a ~~chalcogen compound~~ chalcogen such as oxygen or sulfur), such as, e.g.,  $\text{Li}_y\text{Co}_{1-x}\text{M}_x\text{O}_2$  and  $\text{Li}_y\text{Mn}_{2-x}\text{M}_x\text{O}_4$ . [Examples of M include metals in Groups I to VIII (e.g., one or more elements selected from Li, Ca, Cr, Ni, Fe, and Co). In the lithium-containing transition metal oxides, the value of x, which indicates the displacement amount of the element of a different kind, may be any value up to one corresponding to the maximum displacement

possible. Although such values are effective,  $x$  is preferably in the range of  $0 \leq x \leq 1$  from the standpoint of discharge capacity. With respect to the value of  $y$ , which indicates lithium amount, the maximum amount in which lithium can be reversibly utilized is effective. However,  $y$  is preferably in the range of  $0 \leq y \leq 2$  from the standpoint of discharge capacity.] However, the transition metal oxides should not be construed as being limited to these examples.

**Please replace the paragraph on page 29, line 13, through page 30 line 2, with the following amended paragraph:**

A powder of the positive active material and a powder of the negative-electrode material desirably have an average particle size of 100  $\mu\text{m}$  or smaller. In particular, it is desirable that the average particle size of the powder of the positive active material be 10  $\mu\text{m}$  or smaller for the purpose of improving the high-output characteristics of the non-aqueous electrolyte battery. A grinder and a classifier are used for obtaining a powder having a given ~~shape~~ size. For example, use is made of a mortar, ball mill, sand mill, oscillating ball mill, planetary ball mill, jet mill, counter jet mill, or cyclone type jet mill and sieves or the like. Grinding may be conducted by wet grinding in which water or an organic solvent, e.g., hexane, coexists. Methods of classification are not particularly limited, and sieves, an air classifier, or the like is used in each of dry and wet processes according to need.

**Please replace the paragraph on page 40, line 26, through page 41, line 8, with the following amended paragraph:**

Examples of the monomer having isocyanate groups include toluene diisocyanate. diphenylmethane diisocyanate. 1.6-hexamethylene diisocyanate. ~~2.2.4(2.2.4)-~~ 2.4.4.-trimethyl-hexamethylene diisocyanate. p-phenylene diisocyanate. 4.4'-dicyclohexylmethane diisocyanate. 3.3'-dimethyldiphenyl 4.4'-diisocyanate. dianisidine diisocyanate. m-xylene diisocyanate. trimethylxylene diisocyanate. isophorone diisocyanate. 1.5-naphthalene diisocyanate. trans-1.4-cyclohexyl diisocyanate. and lysine diisocyanate.

**Please replace the paragraph on page 46, lines 12-22, with the following amended paragraph:**

The powder obtained was sieved to recover particles smaller than 75  $\mu\text{m}$ . A lithium hydroxide monohydrate powder was weighed out so that  $\text{Li}/(\text{Ni}+\text{Mn}+\text{Co})=1.0$ . and mixed with the particles by means of a planetary kneader. This mixture was charged into a pot made of alumina. Using an electric furnace, the mixture charged was, in a dry air stream, heated to 850°C at a heating rate of 100 °C/hr. held at the temperature of 850°C for 15 hours, subsequently cooled to 200°C at a cooling rate of 100 °C/hr. and then allowed to cool. The powder obtained was sieved to obtain a powder ~~of 75  $\mu\text{m}$~~  of smaller than 75  $\mu\text{m}$ .

**Please replace the paragraph on page 56, lines 18, through page 57, line 1, with the following amended paragraph:**

The cap 2 and the battery case 10 were laser-welded together at a laser-welded part 3. The non-aqueous electrolyte described above was charged into the battery case 10. which was

then sealed. Thereafter, constant-current ~~low-voltage~~ constant-voltage charge at a current of 0.1 ItA (10 hour rates) and 4.2 V was conducted, and constant-current discharge at a current of 0.1 ItA (10 hour rates) was conducted to a final voltage of 3.0 V. Thus, a prismatic non-aqueous electrolyte battery having a design capacity of 15 Ah was obtained.

**Please replace the paragraph on page 63, lines 11-16, with the following amended paragraph:**

(Active-Material Synthesis Example 3)

~~LiNi<sub>0.25</sub>Mn<sub>0.25</sub>Co<sub>0.95</sub>O<sub>2</sub>~~ LiNi<sub>0.025</sub>Mn<sub>0.025</sub>Co<sub>0.95</sub>O<sub>2</sub> Coating Method (B-03a)

A positive active material was produced in the same manner as in Example 3. The composition thereof was ascertained to be LiNi<sub>0.025</sub>Mn<sub>0.025</sub>Co<sub>0.95</sub>O<sub>2</sub>. This is referred to as active material B-03a.

**Please replace the paragraph on page 66, lines 4-10, with the following amended paragraph:**

(Active-Material Synthesis Example 6)

LiNi<sub>0.0835</sub>Mn<sub>0.0835</sub>Co<sub>0.833</sub>O<sub>2</sub> Coprecipitation Method (B05b)

A positive active material was produced in the same manner as in Example 5. The composition thereof was ascertained to be LiNi<sub>0.0835</sub>Mn<sub>0.0835</sub>Co<sub>0.833</sub>O<sub>2</sub>. This is referred to as active material ~~B-05a~~ B-05b.

**Please replace the paragraph on page 66, lines 17-22, with the following amended paragraph:**

(Active-Material Synthesis Example 8)

$\text{LiNi}_{0.165}\text{Mn}_{0.165}\text{Co}_{0.67}\text{O}_2$  Coating Method (B-11a)

A positive active material was produced in the same manner as in Example 6. The composition thereof was ascertained to be  $\text{LiNi}_{0.165}\text{Mn}_{0.165}\text{Co}_{0.70}\text{O}_2$ .

$\text{LiNi}_{0.165}\text{Mn}_{0.165}\text{Co}_{0.67}\text{O}_2$ . This is referred to as active material B-11a.